



THE ASSOCIATION
FOR RENEWABLE ENERGY
& CLEAN TECHNOLOGY

GASIFICATION: AN INDUSTRY PERSPECTIVE

Hilary Stone
Chair

REA Gasification and Pyrolysis Group

NOTE: The views expressed in these slides
are those of the author not the REA

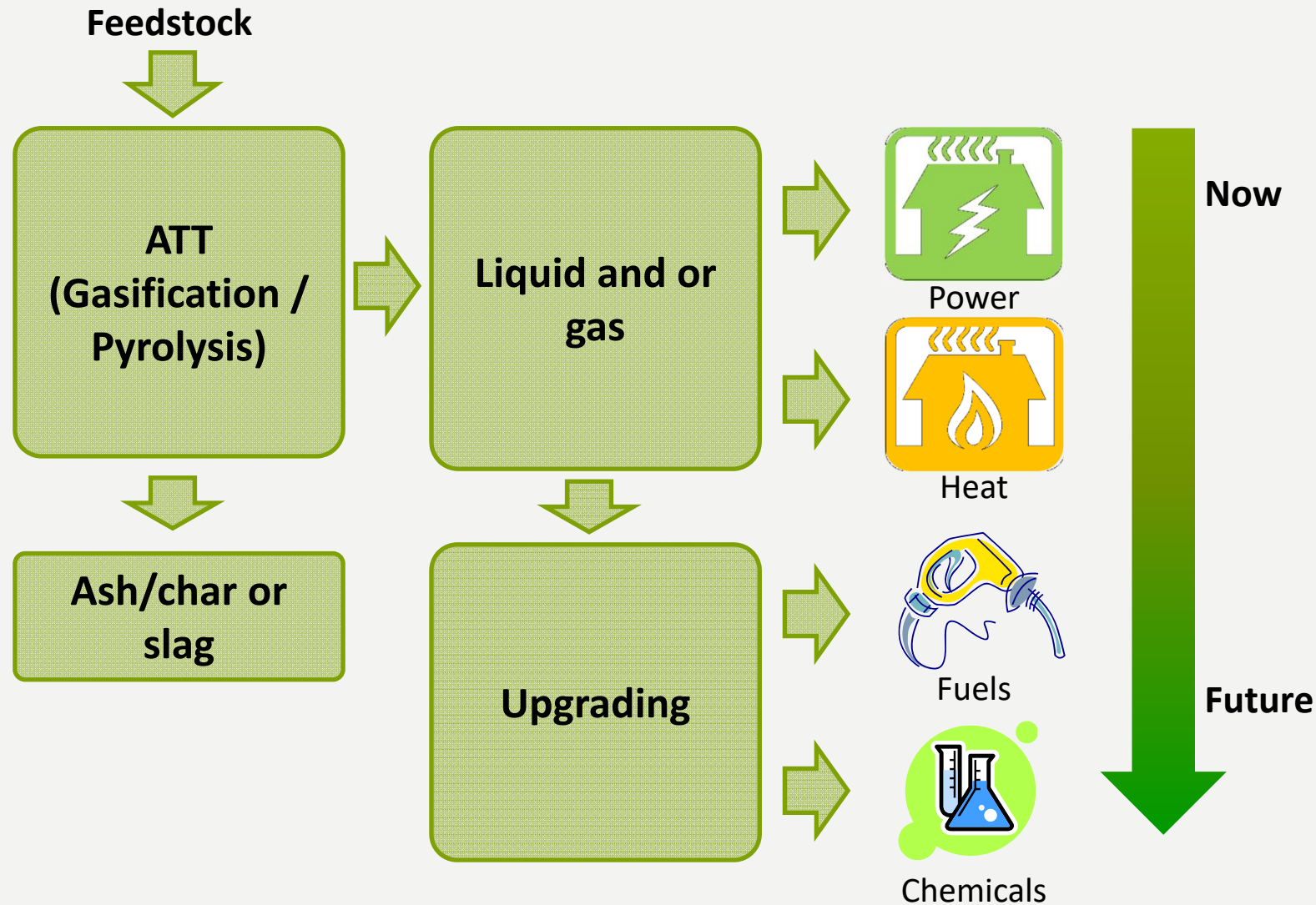


REA Gasification and Pyrolysis Working Group

- Technology providers
- Project developers, owners, operators and others making energy from waste (EfW) projects a reality in the UK incorporating gasification and pyrolysis
- Meeting every 6-8 weeks to address common issues and challenges and to share best practices



Energy recovery process and purpose 2011



Gasification – a chequered history

- REA G+P group was founded in 2010 (previously those with G+P interests attended Bioenergy Group meetings)
- Only one of the original members still trading (SUEZ) and although G+P is probably in its fourth iteration of members - technologies still continue to come forward
- Originally focussed on electricity production
- Now looking towards development fuels
- Why?



Why?

- Policy uncertainty
- The time and costs of
 - Planning
 - Permitting
- Feedstock issues
- Barrier caused by lack of EPC contractors to take on risk of construction
- Investors are wary
- Investment risk profile remains a barrier



Policy uncertainty

- Double ROCs introduced in 2010 under ROO 2009
- Provided participants with support per MWh of renewable electricity generated at a fixed rate for 20 years
- Fixed rates from 2009 to 2013 to provide certainty for generators.

Band	2013/14	2014/15	2015/16	2016/17
Advanced gasification	2	2	1.9	1.8



Policy uncertainty

- By 2016-17 the buy out price was £44.77
- Caused concern at the escalating cost of the scheme.
- It was closed to new entrants in 2017
- Replaced by Contracts for Difference.
- A sealed bid auction based on the strike price established by the auction for a specific delivery year it rewards the least expensive projects with CfDs.



Contracts for Difference

- CfD guarantees the generator that it will receive an amount equal to the CfD strike price for its power output.
- If the CfD reference price - the market price - is lower than the CfD strike price, the generator receives a top-up payment under the CfD equal to the difference between the strike price and the reference price.
- If the reference price is higher than the strike price the generator pays the difference to the CfD counterparty for each MWh it sells.



Contracts for Difference

Developer	Technology Type	Capacity (MW)	Strike Price (£/MWh)	Delivery Year
Bulwell Energy Limited	ACT	27.50	£39.650	2023/24
Small Heath Bio Power Ltd	ACT	6.10	£41.611	2024/25

- ACTs administrative strike price 23/24 £113
- ACTs administrative strike price 24/25 £111
- Average wholesale price of electricity about £50/MWh
- CfDs have failed for ACTs



Why?

- 3 auctions have been held since 2017 – there is no specific time frame for each auction
- Milestone delivery dates under the CfD contract do not fit well with ACT project development
- Energy efficiency criteria within the CfD makes the contract even harder to meet
- How long does it take to obtain a CfD?
- How long does it take to establish a fully commercialised gasification system from inception to full production?



It's not all bad news

- Government is beginning to understand the advantages of ACTs
- Gasification has been identified in:
 - Waste and Resource Strategy,
 - Clean Growth Plan and
 - RTFO

As having a part to play in the energy mix

- The CCC have stated that ACTs are of strategic importance.
- However these mentions are all for transport fuels and heat applications.....



So from electricity to transport fuels

- The Renewable Transport Fuel Obligation requires obligated suppliers to supply 10.637% sustainable biofuel pa by 2020 (4.987% in 2018)
- Compliance is demonstrated through a mixture of redeeming Renewable Transport Fuel Certificates (RTFCs) and/or by paying a fixed sum (currently £0.30) for each litre of fuel for which they wish to 'buy-out' of their obligation.
- RTFCs are obtained by obligated suppliers through the supply of renewable fuels.



Transport fuels 2018

- Sub-target for 'development fuels' was applied
- Development fuels include certain waste based renewable fuels and certain renewable fuels of non-biological origin.
- Initially 0.109% of supply from 2019, it rises to 3.196% by 2032.
- Obligated suppliers are being incentivised to supply development fuels through development fuel RTFCs.
- RTFO extended to include renewable aviation fuels and renewable fuels of non-biological origin



Feedstock issues

- Tolvik (2018) estimate that by 2020 the UK Operational Capacity will be 14.8Mt.
- Based on the status of various projects which are currently in the most advanced stages of development, this is projected to rise to at least 15.7Mt by 2022.
- Defra forecasts that even if the ambitions to reduce waste in the first place and recycle 65% of arisings, there will still be 20Mt of residual waste to deal with in 2035.
- Brexit will significantly impact flows and economics of RDF exports.



REA



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REA Discussion Paper

Going Negative – Policy Proposals for
UK Bioenergy with Carbon Capture and
Storage (BECCS)



Why BECCS?

- What is BECCS?
- What role could BECCS play in meeting UK climate targets?
- How can BECCS best be deployed in the UK?
- What might BECCS cost?
- Is BECCS an economic opportunity for the UK?
- What are the possible policy options for the incentivisation of BECCS – both the adaptation of existing mechanisms, and the design of new supportive policy?



Policy Proposals

- A marked increase in and expansion of the UK carbon price (£50/tCO₂ by 2020, £80/tCO₂ by 2035)
 - This will place the necessary price on carbon emissions to incentivise its capture, usage and storage across the energy (and wider) economy
- The implementation of a mechanism to reward negative emissions (e.g. Negative Emissions Allowances);
 - This will directly reward negative emissions providers and, through an EU-linked Emissions Trading Scheme, provide an international market for BECCS
- The adaptation of existing supportive UK policy to include BECCS.
 - This will ensure the bioenergy technologies underpinning BECCS are properly supported



Supporting Bioenergy for BECCS

- Government should consult on options for incentivising negative emissions from BECCS configurations.
 - These could include: modifying the CfD to provide support for large-scale bioelectricity CCS; using Negative Emissions Allowances (NEAs) as part of a UK-EU ETS to reward BECCS in heat and transport; and extending the GHG Regulations to provide credits for biofuel production with CCUS.
- Government should consider additional supportive policies for bioenergy technologies underpinning BECCS (Anaerobic Digestion, Energy from Waste, Biomass Power, Biomass Heat and Biofuel production)
- Government could include BECCS under the State Aid exemption category for emerging technologies so as to allow multiple support instruments for its development and deployment
- Government should establish at least one commercial large-scale BECCS project and several smaller demonstration scale BECCS projects by the late 2020s.



BECCS in summary

- “The REA recommends increasing the UK total carbon price to around £50t/CO₂ from 2020 with a clear trajectory to at least 2035 in order to promote rapid emission reductions
- The UK should also explore a mechanism which rewards negative emissions, such as tradeable negative emissions allowances under a domestic emissions trading scheme.
- Finally, the UK should incentivise the deployment of demonstration projects at several scales that prioritise the use of lowest carbon feedstocks whilst making BECCS plant eligible for support under existing UK policy, such as the Contracts for Difference (CfD) mechanism”

